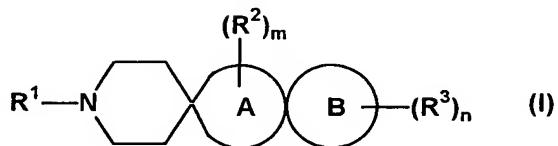


CLAIMS

1. A spiroheterocyclic ring derivatives of the formula (I)



wherein R¹ is:

- (1) hydrogen,
- (2) C1-18 alkyl,
- (3) C2-18 alkenyl,
- (4) C2-18 alkynyl,
- (5) -COR⁶,
- (6) -CONR⁷R⁸,
- (7) -COOR⁹,
- (8) -SO₂R¹⁰,
- (9) -COCOOR¹¹,
- (10) -CONR¹²COR¹³,
- (11) Cyc 1, or
- (12) C1-18 alkyl, C2-18 alkenyl or C2-18 alkynyl substituted by 1-5 substituent(s) selected from (a) halogen, (b) -CONR⁷R⁸, (c) -COOR⁹, (d) -OR¹⁴, (e) -SR¹⁵, (f) -NR¹⁶R¹⁷, (g) -NR¹⁸COR¹⁹, (h) -SO₂NR²⁰R²¹, (i) -OCOR²², (j) -NR²³SO₂R²⁴, (k) -NR²⁵COOR²⁶, (l) -NR²⁷CONR²⁸R²⁹, (m) Cyc 1, (n) keto or (o) -N(SO₂R²⁴)₂,

wherein R⁶-R⁹, R¹¹-R²¹, R²³, R²⁵ and R²⁷-R²⁹ are each independently:

- (1) hydrogen,
- (2) C1-8 alkyl,
- (3) C2-8 alkenyl,
- (4) C2-8 alkynyl,

(5) Cyc 1, or

(6) C1-8 alkyl, C2-8 alkenyl or C2-8 alkynyl substituted by 1-5 substituent(s)

selected from (a) Cyc 1, (b) halogen, (c) -OR³⁰, (d) -SR³¹, (e) -NR³²R³³, (f) -COOR³⁴, (g) -CONR³⁵R³⁶, (h) -NR³⁷COR³⁸, (i) -NR³⁹SO₂R⁴⁰ or (j) -N(SO₂R⁴⁰)₂, or

R⁷ and R⁸, R²⁰ and R²¹, R²⁸ and R²⁹, taken together, are 1) C2-6 alkylene, 2) -(C2-6 alkylene)-O-(C2-6 alkylene)-, 3) -(C2-6 alkylene)-S-(C2-6 alkylene)- or 4) -(C2-6 alkylene)-NR¹⁹⁵-(C2-6 alkylene)-,

R¹⁹⁵ is hydrogen, C1-8 alkyl, phenyl or C1-8 alkyl substituted by phenyl,

R¹⁰, R²², R²⁴ and R²⁶ are each independently:

(1) C1-8 alkyl,

(2) C2-8 alkenyl,

(3) C2-8 alkynyl,

(4) Cyc 1, or

(5) C1-8 alkyl, C2-8 alkenyl or C2-8 alkynyl substituted by 1-5 substituent(s)

selected from (a) Cyc 1, (b) halogen, (c) -OR³⁰, (d) -SR³¹, (e) -NR³²R³³, (f) -COOR³⁴, (g) -CONR³⁵R³⁶, (h) -NR³⁷COR³⁸, (i) -NR³⁹SO₂R⁴⁰ or (j) -N(SO₂R⁴⁰)₂,

R³⁰-R³⁷ and R³⁹ are each independently, hydrogen, C1-8 alkyl, Cyc 1 or C1-8 alkyl substituted by Cyc 1, or

R³⁵ and R³⁶, taken together, are 1) C2-6 alkylene, 2) -(C2-6 alkylene)-O-(C2-6 alkylene)-, 3) -(C2-6 alkylene)-S-(C2-6 alkylene)- or 4) -(C2-6 alkylene)-NR¹⁹⁶-(C2-6 alkylene)-,

R¹⁹⁶ is hydrogen, C1-8 alkyl, phenyl or C1-8 alkyl substituted by phenyl,

R³⁸ and R⁴⁰ are each independently C1-8 alkyl, Cyc 1 or C1-8 alkyl substituted by Cyc 1,

Cyc 1 is a C3-15 mono, bi- or tri-(fused or spiro)carbocyclic ring or a 3-15 membered mono-, bi- or tri-(fused or spiro)cyclic hetero ring containing 1-4 nitrogen atom(s), 1-3 oxygen atom(s) and/or 1-3 sulfur atom(s),

Cyc 1 may be substituted by 1-5 of R⁵¹,

R⁵¹ is:

- (1) C1-8 alkyl,
- (2) C2-8 alkenyl,
- (3) C2-8 alkynyl,
- (4) halogen,
- (5) nitro,
- (6) trifluoromethyl,
- (7) trifluoromethoxy,
- (8) nitrile,
- (9) keto,
- (10) Cyc 2
- (11) -OR⁵²,
- (12) -SR⁵³,
- (13) -NR⁵⁴R⁵⁵,
- (14) -COOR⁵⁶,
- (15) -CONR⁵⁷R⁵⁸,
- (16) -NR⁵⁹COR⁶⁰,
- (17) -SO₂NR⁶¹R⁶²,
- (18) -OCOR⁶³,
- (19) -NR⁶⁴SO₂R⁶⁵,
- (20) -NR⁶⁶COOR⁶⁷,
- (21) -NR⁶⁸CONR⁶⁹R⁷⁰,
- (22) -B(OR⁷¹)₂,
- (23) -SO₂R⁷²,
- (24) -N(SO₂R⁷²)₂, or

(25) C1-8 alkyl, C2-8 alkenyl or C2-8 alkynyl substituted by 1-5 substituent(s) selected from (a) halogen, (b) Cyc 2, (c) -OR⁵², (d) -SR⁵³, (e) -NR⁵⁴R⁵⁵, (f) -COOR⁵⁶, (g) -CONR⁵⁷R⁵⁸, (h) -NR⁵⁹COR⁶⁰, (i) -SO₂NR⁶¹R⁶², (j) -OCOR⁶³, (k) -NR⁶⁴SO₂R⁶⁵, (l) -NR⁶⁶COOR⁶⁷, (m) -NR⁶⁸CONR⁶⁹R⁷⁰, (n) -B(OR⁷¹)₂, (o) -SO₂R⁷², (p) -N(SO₂R⁷²)₂ or (q) keto,

R⁵²-R⁶², R⁶⁴, R⁶⁶ and R⁶⁸-R⁷¹ are each independently 1) hydrogen, 2) C1-8 alkyl, 3) C2-8 alkenyl, 4) C2-8 alkynyl, 5) Cyc 2 or 6) C1-8 alkyl, C2-8 alkenyl or C2-8 alkynyl substituted by Cyc 2, -OR⁷³, -COOR⁷⁴ or -NR⁷⁵R⁷⁶, or

R⁵⁷ and R⁵⁸, R⁶¹ and R⁶², R⁶⁹ and R⁷⁰, taken together, are 1) C2-6 alkylene, 2) -(C2-6 alkylene)-O-(C2-6 alkylene)-, 3) -(C2-6 alkylene)-S-(C2-6 alkylene)- or 4) -(C2-6 alkylene)-NR¹⁹⁷-(C2-6 alkylene)-,

R¹⁹⁷ is hydrogen, C1-8 alkyl, phenyl or C1-8 alkyl substituted by phenyl, R⁶³, R⁶⁵, R⁶⁷ and R⁷² are each independently 1) C1-8 alkyl, 2) C2-8 alkenyl, 3) C2-8 alkynyl, 4) Cyc 2 or 5) C1-8 alkyl, C2-8 alkenyl or C2-8 alkynyl substituted by Cyc 2, -OR⁷³, -COOR⁷⁴ or -NR⁷⁵R⁷⁶,

R⁷³-R⁷⁶ are independently hydrogen, C1-8 alkyl, Cyc 2 or C1-8 alkyl substituted by Cyc 2,

Cyc 2 has the same meaning as Cyc 1,

Cyc 2 may be substituted by 1-5 of R⁷⁷,

R⁷⁷ is:

- 1) C1-8 alkyl,
- 2) halogen,
- 3) nitro,
- 4) trifluoromethyl,
- 5) trifluoromethoxy,
- 6) nitrile,
- 7) -OR⁷⁸,

8) $-\text{NR}^{79}\text{R}^{80}$,
 9) $-\text{COOR}^{81}$,
 10) $-\text{SR}^{82}$,
 11) $-\text{CONR}^{83}\text{R}^{84}$,
 12) C2-8 alkenyl,
 13) C2-8 alkynyl,
 14) keto,
 15) Cyc 6,
 16) $-\text{NR}^{161}\text{COR}^{162}$,
 17) $-\text{SO}_2\text{NR}^{163}\text{R}^{164}$,
 18) $-\text{OCOR}^{165}$,
 19) $-\text{NR}^{166}\text{SO}_2\text{R}^{167}$,
 20) $-\text{NR}^{168}\text{COOR}^{169}$,
 21) $-\text{NR}^{170}\text{CONR}^{171}\text{R}^{172}$,
 22) $-\text{SO}_2\text{R}^{173}$,
 23) $-\text{N}(\text{SO}_2\text{R}^{167})_2$, or
 24) C1-8 alkyl, C2-8 alkenyl or C2-8 alkynyl substituted by 1-5
 substituent(s) selected from (a) halogen, (b) $-\text{OR}^{78}$, (c) $-\text{NR}^{79}\text{R}^{80}$, (d) $-\text{COOR}^{81}$,
 (e) $-\text{SR}^{82}$, (f) $-\text{CONR}^{83}\text{R}^{84}$, (g) keto, (h) Cyc 6, (i) $-\text{NR}^{161}\text{COR}^{162}$, (j) $-\text{SO}_2\text{NR}^{163}\text{R}^{164}$,
 (k) $-\text{OCOR}^{165}$, (l) $-\text{NR}^{166}\text{SO}_2\text{R}^{167}$, (m) $-\text{NR}^{168}\text{COOR}^{169}$, (n) $-\text{NR}^{170}\text{CONR}^{171}\text{R}^{172}$,
 (o) $-\text{SO}_2\text{R}^{173}$ or (p) $-\text{N}(\text{SO}_2\text{R}^{167})_2$,

$\text{R}^{78}\text{-R}^{84}$, $\text{R}^{161}\text{-R}^{164}$, R^{166} , R^{168} and $\text{R}^{170}\text{-R}^{172}$ are each independently (a)
 hydrogen, (b) C1-8 alkyl, (c) C2-8 alkenyl, (d) C2-8 alkynyl, (e) Cyc 6 or (f) C1-8 alkyl,
 C2-8 alkenyl or C2-8 alkynyl substituted by Cyc 6, $-\text{OR}^{174}$, $-\text{COOR}^{175}$, $-\text{NR}^{176}\text{R}^{177}$
 or $-\text{CONR}^{178}\text{R}^{179}$, or

R^{83} and R^{84} , R^{163} and R^{164} , R^{171} and R^{172} , taken together, are 1) C2-6 alkylene, 2) -(C2-6 alkylene)-O-(C2-6 alkylene)-, 3) -(C2-6 alkylene)-S-(C2-6 alkylene)- or 4) -(C2-6 alkylene)-NR¹⁹⁸-(C2-6 alkylene)-,

R^{198} is hydrogen, C1-8 alkyl, phenyl or C1-8 alkyl substituted by phenyl,

R^{165} , R^{167} , R^{169} and R^{173} are each independently (a) C1-8 alkyl, (b) C2-8 alkenyl, (c) C2-8 alkynyl, (d) Cyc 6 or (e) C1-8 alkyl, C2-8 alkenyl or C2-8 alkynyl substituted by Cyc 6, -OR¹⁷⁴, -COOR¹⁷⁵, -NR¹⁷⁶R¹⁷⁷ or -CONR¹⁷⁸R¹⁷⁹,

R^{174} -R¹⁷⁷ are each independently (1) hydrogen, (2) C1-8 alkyl, (3) Cyc 6 or (4) C1-8 alkyl substituted by Cyc 6, or

R^{178} and R^{179} , taken together, are 1) C2-6 alkylene, 2) -(C2-6 alkylene)-O-(C2-6 alkylene)-, 3) -(C2-6 alkylene)-S-(C2-6 alkylene)- or 4) -(C2-6 alkylene)-NR¹⁹⁹-(C2-6 alkylene)-,

R^{199} is hydrogen, C1-8 alkyl, phenyl or C1-8 alkyl substituted by phenyl,

Cyc 6 is a C3-8 mono-carbocyclic ring or a 3-8 membered mono-cyclic hetero ring containing 1-4 nitrogen atom(s), 1-2 oxygen atom(s) and/or 1-2 sulfur atom(s),

Cyc 6 may be substituted by 1-5 of R^{180} ,

R^{180} is:

- (1) C1-8 alkyl,
- (2) halogen,
- (3) nitro,
- (4) trifluoromethyl,
- (5) trifluoromethoxy,
- (6) nitrile,
- (7) -OR¹⁸¹,
- (8) -NR¹⁸²R¹⁸³,
- (9) -COOR¹⁸⁴,

(10) $-\text{SR}^{185}$, or

(11) $-\text{CONR}^{186}\text{R}^{187}$,

$\text{R}^{181}\text{-R}^{187}$ are each independently (1) hydrogen, (2) C1-8 alkyl, (3) phenyl or

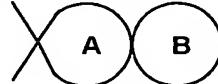
(4) C1-8 alkyl substituted by phenyl, or

R^{182} and R^{183} , R^{186} and R^{187} , taken together, are (1) C2-6 alkylene,

(2) $-(\text{C2-6 alkylene})\text{-O}-(\text{C2-6 alkylene})$ -, (3) $-(\text{C2-6 alkylene})\text{-S}-(\text{C2-6 alkylene})$ - or

(4) $-(\text{C2-6 alkylene})\text{-NR}^{200}-(\text{C2-6 alkylene})$ -,

R^{200} is hydrogen, C1-8 alkyl, phenyl or C1-8 alkyl substituted by phenyl,



is (i) a fused bi-cyclic ring which A ring and B ring bound

by two atoms or (ii) a spiro ring which A ring and B ring bound by spiro,

A ring is (i) a C5 or 6 partially or fully saturated carbocyclic ring or (ii) a 5 or 6 membered partially or fully saturated hetero ring containing 1-3 hetero atom(s) selected from a nitrogen atom(s), an oxygen atom(s) and/or a sulfur atom(s),

B ring is (i) a C4-7 partially or fully saturated carbocyclic ring or (ii) a 4-7 membered partially or fully saturated hetero ring containing 1-3 hetero atom(s) selected from a nitrogen atom(s), an oxygen atom(s) and/or a sulfur atom(s),

R^2 is:

(1) keto,

(2) thioketo,

(3) C1-8 alkyl,

(4) C2-8 alkenyl,

(5) C2-8 alkynyl,

(6) $-\text{OR}^{90}$,

(7) Cyc 3, or

(8) C1-8 alkyl, C2-8 alkenyl or C2-8 alkynyl substituted by 1-5 substituent(s)

selected from (a) halogen, (b) $-\text{OR}^{90}$, (c) $-\text{SR}^{91}$, (d) $-\text{NR}^{92}\text{R}^{93}$, (e) $-\text{COOR}^{94}$,

(f) $-\text{CONR}^{95}\text{R}^{96}$, (g) $-\text{NR}^{97}\text{COR}^{98}$, (h) $-\text{SO}_2\text{NR}^{99}\text{R}^{100}$, (i) $-\text{OCOR}^{101}$, (j) $-\text{NR}^{102}\text{SO}_2\text{R}^{103}$, (k) $-\text{NR}^{104}\text{COOR}^{105}$, (l) $-\text{NR}^{106}\text{CONR}^{107}\text{R}^{108}$, (m) Cyc 3, (n) keto or (o) $-\text{N}(\text{SO}_2\text{R}^{103})_2$,

R^{90} - R^{100} , R^{102} , R^{104} and R^{106} - R^{108} are each independently (1) hydrogen, (2) C1-8 alkyl, (3) C2-8 alkenyl, (4) C2-8 alkynyl, (5) Cyc 3 or (6) C1-8 alkyl, C2-8 alkenyl or C2-8 alkynyl substituted by Cyc 3, or

R^{95} and R^{96} , R^{99} and R^{100} , R^{107} and R^{108} , taken together, are (1) C2-6 alkylene, (2) $-(\text{C2-6 alkylene})\text{-O}-(\text{C2-6 alkylene})-$, (3) $-(\text{C2-6 alkylene})\text{-S}-(\text{C2-6 alkylene})-$ or (4) $-(\text{C2-6 alkylene})\text{-NR}^{202}-(\text{C2-6 alkylene})-$,

R^{202} is hydrogen, C1-8 alkyl, phenyl or C1-8 alkyl substituted by phenyl, R^{101} , R^{103} and R^{105} are each independently (1) C1-8 alkyl, (2) C2-8 alkenyl, (3) C2-8 alkynyl or (4) Cyc 3, or (5) C1-8 alkyl, C2-8 alkenyl or C2-8 alkynyl substituted by Cyc 3,

Cyc 3 has the same meaning as Cyc 1,

Cyc 3 may be substituted by 1-5 of R^{109} ,

R^{109} has the same meaning as R^{51} ,

R^3 is:

(1) C1-8 alkyl,

(2) C2-8 alkenyl,

(3) C2-8 alkynyl,

(4) $-\text{COOR}^{120}$,

(5) $-\text{CONR}^{121}\text{R}^{122}$,

(6) Cyc 4, or

(7) $-\text{OR}^{123}$,

(8) $-\text{COR}^{131}$,

(9) $-\text{SO}_2\text{R}^{133}$, or

(10) C1-8 alkyl, C2-8 alkenyl or C2-8 alkynyl substituted by a substituent(s)

selected from (a) halogen, (b) nitrile, (c) Cyc 4, (d) $-\text{COOR}^{120}$, (e) $-\text{CONR}^{121}\text{R}^{122}$,

(f) $-\text{OR}^{123}$, (g) $-\text{SR}^{124}$, (h) $-\text{NR}^{125}\text{R}^{126}$, (i) $-\text{NR}^{127}\text{COR}^{128}$, (j) $-\text{SO}_2\text{NR}^{129}\text{R}^{130}$, (k) $-\text{OCOR}^{131}$,
(l) $-\text{NR}^{132}\text{SO}_2\text{R}^{133}$, (m) $-\text{NR}^{134}\text{COOR}^{135}$, (n) $-\text{NR}^{136}\text{CONR}^{137}\text{R}^{138}$ or (o) keto,

$\text{R}^{120}-\text{R}^{130}$, R^{132} , R^{134} and $\text{R}^{136}-\text{R}^{138}$ are each independently (1) hydrogen, (2) C1-8 alkyl, (3) C2-8 alkenyl, (4) C2-8 alkynyl, (5) Cyc 4 or (6) C1-8 alkyl, C2-8 alkenyl or C2-8 alkynyl substituted by Cyc 4, halogen, $-\text{OR}^{148}$, $-\text{SR}^{149}$, $-\text{COOR}^{150}$ or $-\text{NHCOR}^{141}$, or

R^{121} and R^{122} , R^{129} and R^{130} , R^{137} and R^{138} , taken together, are 1) C2-6 alkylene, 2) $-(\text{C2-6 alkylene})-\text{O}-(\text{C2-6 alkylene})-$, 3) $-(\text{C2-6 alkylene})-\text{S}-(\text{C2-6 alkylene})-$ or 4) $-(\text{C2-6 alkylene})-\text{NR}^{202}-(\text{C2-6 alkylene})-$,

R^{202} is hydrogen, C1-8 alkyl, phenyl or C1-8 alkyl substituted by phenyl,

R^{131} , R^{133} and R^{135} are each independently (1) C1-8 alkyl, (2) C2-8 alkenyl, (3) C2-8 alkynyl, (4) Cyc 4 or (5) C1-8 alkyl, C2-8 alkenyl or C2-8 alkynyl substituted by Cyc 4, halogen, $-\text{OR}^{148}$, $-\text{SR}^{149}$, $-\text{COOR}^{150}$ or $-\text{NHCOR}^{141}$,

R^{141} is (1) C1-8 alkyl, (2) C2-8 alkenyl, (3) C2-8 alkynyl, (4) Cyc 4 or (5) C1-8 alkyl, C2-8 alkenyl or C2-8 alkynyl substituted by Cyc 4,

$\text{R}^{148}-\text{R}^{150}$ are each independently (1) hydrogen, (2) C1-8 alkyl, (3) C2-8 alkenyl, (4) C2-8 alkynyl, (5) Cyc 4 or (6) C1-8 alkyl, C2-8 alkenyl or C2-8 alkynyl substituted by Cyc 4,

Cyc 4 has the same meaning as Cyc 1,

Cyc 4 may be substituted by 1-5 of R^{144} ,

R^{144} has the same meaning as R^{51} ,

m is 0-5,

n is 0-5,

when m is 2-5, then R^2 of m are the same or different,

when n is 2-5, then R^3 of n are the same or different,

a quaternary ammonium salt thereof, an N-oxides thereof or a non-toxic salt thereof.

2. The compound according to claim 1, which is

- (1) (3R)-1-butyl-2,5-dioxo-3,4-(2-thiapropano)-9-[(1,4-benzodioxan-6-yl)methyl]-1,4,9-triazaspiro[5.5]undecane,
- (2) (3R)-1-butyl-2,5-dioxo-3,4-(2-thiapropano)-9-[(4-phenoxyphenyl)methyl]-1,4,9-triazaspiro[5.5]undecane,
- (3) (3S)-1-(2-methylpropyl)-2,5-dioxo-3,4-propano-9-(2-phenylethyl)-1,4,9-triazaspiro[5.5]undecane,
- (4) (3S)-1-(1-benzyl-4-pyperidinyl)-2,5-dioxo-3,4-propano-9-(2-phenylethyl)-1,4,9-triazaspiro[5.5]undecane,
- (5) (3S)-1-(2,2-diphenylpropyl)-2,5-dioxo-3,4-propano-9-(2-phenylethyl)-1,4,9-triazaspiro[5.5]undecane,
- (6) 1-(2-furanyl methyl)-2,5-dioxo-3,4-propano-9-benzyl-1,4,9-triazaspiro[5.5]undecane,
- (7) 1-(2-tetrahydrofuranyl methyl)-2,5-dioxo-3,4-propano-9-benzyl-1,4,9-triazaspiro[5.5]undecane,
- (8) 1-(2-(3-indole)ethyl)-2,5-dioxo-3,4-propano-9-benzyl-1,4,9-triazaspiro[5.5]undecane,
- (9) 1,9-dibenzyl-2,5-dioxo-3,4-propano-1,4,9-triazaspiro[5.5]undecane,
- (10) 1-(2,2-diphenylethyl)-2,5-dioxo-3,4-propano-9-benzyl-1,4,9-triazaspiro[5.5]undecane,
- (11) 1-(2-phenylethyl)-2,5-dioxo-3,4-propano-9-benzyl-1,4,9-triazaspiro[5.5]undecane,
- (12) 1-propyl-2,5-dioxo-3,4-propano-9-benzyl-1,4,9-triazaspiro[5.5]undecane,
- (13) 1-(1-benzyl-3-pyrrolidinyl)-2,5-dioxo-3,4-propano-9-benzyl-1,4,9-triazaspiro[5.5]undecane,

(14) 1-(2-tetrahydrofuranyl methyl)-2,5-dioxo-3,4-propano-9-(2-phenylethyl)-1,4,9-triazaspiro[5.5]undecane,

(15) 1-(2-(3-indole)ethyl)-2,5-dioxo-3,4-propano-9-(2-phenylethyl)-1,4,9-triazaspiro[5.5]undecane,

(16) 1-benzyl-2,5-dioxo-3,4-propano-9-(2-phenylethyl)-1,4,9-triazaspiro[5.5]undecane,

(17) 1-(2,2-diphenylethyl)-2,5-dioxo-3,4-propano-9-(2-phenylethyl)-1,4,9-triazaspiro[5.5]undecane,

(18) 1-(2-phenylethyl)-2,5-dioxo-3,4-propano-9-(2-phenylethyl)-1,4,9-triazaspiro[5.5]undecane,

(19) 1-propyl-2,5-dioxo-3,4-propano-9-(2-phenylethyl)-1,4,9-triazaspiro[5.5]undecane,

(20) 1-(1-benzyl-3-pyrrolidinyl)-2,5-dioxo-3,4-propano-9-(2-phenylethyl)-1,4,9-triazaspiro[5.5]undecane,

(21) 1-(2-furanyl methyl)-2,5-dioxo-3,4-propano-9-(3-phenylpropyl)-1,4,9-triazaspiro[5.5]undecane,

(22) 1-(2-tetrahydrofuran methyl)-2,5-dioxo-3,4-propano-9-(3-phenylpropyl)-1,4,9-triazaspiro[5.5]undecane,

(23) 1-(2-(3-indole)ethyl)-2,5-dioxo-3,4-propano-9-(3-phenylpropyl)-1,4,9-triazaspiro[5.5]undecane,

(24) 1-benzyl-2,5-dioxo-3,4-propano-9-(3-phenylpropyl)-1,4,9-triazaspiro[5.5]undecane,

(25) 1-(2,2-diphenylethyl)-2,5-dioxo-3,4-propano-9-(3-phenylpropyl)-1,4,9-triazaspiro[5.5]undecane,

(26) 1-(2-phenylethyl)-2,5-dioxo-3,4-propano-9-(3-phenylpropyl)-1,4,9-triazaspiro[5.5]undecane,

(27) 1-propyl-2,5-dioxo-3,4-propano-9-(3-phenylpropyl)-1,4,9-triazaspiro[5.5]undecane,

(28) 1-(1-benzyl-3-pyrrolidinyl)-2,5-dioxo-3,4-propano-9-(3-phenylpropyl)-1,4,9-triazaspiro[5.5]undecane,

(29) 1-(2-furanylmethyl)-2,5-dioxo-3,4-propano-9-(4-phenylbutyl)-1,4,9-triazaspiro[5.5]undecane,

(30) 1-(2-tetrahydrofuranylmethyl)-2,5-dioxo-3,4-propano-9-(4-phenylbutyl)-1,4,9-triazaspiro[5.5]undecane,

(31) 1-(2-(3-indole)ethyl)-2,5-dioxo-3,4-propano-9-(4-phenylbutyl)-1,4,9-triazaspiro[5.5]undecane,

(32) 1-benzyl-2,5-dioxo-3,4-propano-9-(4-phenylbutyl)-1,4,9-triazaspiro[5.5]undecane,

(33) 1-(2,2-diphenylethyl)-2,5-dioxo-3,4-propano-9-(4-phenylbutyl)-1,4,9-triazaspiro[5.5]undecane,

(34) 1-(2-phenylethyl)-2,5-dioxo-3,4-propano-9-(4-phenylbutyl)-1,4,9-triazaspiro[5.5]undecane,

(35) 1-propyl-2,5-dioxo-3,4-propano-9-(4-phenylbutyl)-1,4,9-triazaspiro[5.5]undecane,

(36) 1-(1-benzyl-3-pyrrolidinyl)-2,5-dioxo-3,4-propano-9-(4-phenylbutyl)-1,4,9-triazaspiro[5.5]undecane,

(37) 1-(2-furanylmethyl)-2,5-dioxo-3,4-propano-9-phenyl-1,4,9-triazaspiro[5.5]undecane,

(38) 1-(2-tetrahydrofuranylmethyl)-2,5-dioxo-3,4-propano-9-phenyl-1,4,9-triazaspiro[5.5]undecane,

(39) 1-(2-(3-indole)ethyl)-2,5-dioxo-3,4-propano-9-phenyl-1,4,9-triazaspiro[5.5]undecane,

(40) 1-benzyl-2,5-dioxo-3,4-propano-9-phenyl-1,4,9-triazaspiro[5.5]undecane,

(41) 1-(2,2-diphenylethyl)-2,5-dioxo-3,4-propano-9-phenyl-1,4,9-triazaspiro[5.5]undecane,

(42) 1-(2-phenylethyl)-2,5-dioxo-3,4-propano-9-phenyl-1,4,9-triazaspiro[5.5]undecane,

(43) 1-propyl-2,5-dioxo-3,4-propano-9-phenyl-1,4,9-triazaspiro[5.5]undecane,

(44) 1-(2-tetrahydrofurylmethyl)-2,5-dioxo-3,4-propano-9-(5-phenylpentyl)-1,4,9-triazaspiro[5.5]undecane,

(45) 1-(2-(3-indole)ethyl)-2,5-dioxo-3,4-propano-9-(5-phenylpentyl)-1,4,9-triazaspiro[5.5]undecane,

(46) 1-benzyl-2,5-dioxo-3,4-propano-9-(5-phenylpentyl)-1,4,9-triazaspiro[5.5]undecane,

(47) 1-(2,2-diphenylethyl)-2,5-dioxo-3,4-propano-9-(5-phenylpentyl)-1,4,9-triazaspiro[5.5]undecane,

(48) 1-(2-phenylethyl)-2,5-dioxo-3,4-propano-9-(5-phenylpentyl)-1,4,9-triazaspiro[5.5]undecane,

(49) 1-propyl-2,5-dioxo-3,4-propano-9-(5-phenylpentyl)-1,4,9-triazaspiro[5.5]undecane,

(50) 1-(1-benzyl-3-pyrrolidinyl)-2,5-dioxo-3,4-propano-9-(5-phenylpentyl)-1,4,9-triazaspiro[5.5]undecane,

(51) 1-(2-tetrahydrofurylmethyl)-2,5-dioxo-3,4-propano-9-(6-phenylhexyl)-1,4,9-triazaspiro[5.5]undecane,

(52) 1-(2-(3-indole)ethyl)-2,5-dioxo-3,4-propano-9-(6-phenylhexyl)-1,4,9-triazaspiro[5.5]undecane,

(53) 1-benzyl-2,5-dioxo-3,4-propano-9-(6-phenylhexyl)-1,4,9-triazaspiro[5.5]undecane,

(54) 1-(2,2-diphenylethyl)-2,5-dioxo-3,4-propano-9-(6-phenylhexyl)-1,4,9-triazaspiro[5.5]undecane,

(55) 1-(2-phenylethyl)-2,5-dioxo-3,4-propano-9-(6-phenylhexyl)-1,4,9-triazaspiro[5.5]undecane,

(56) 1-propyl-2,5-dioxo-3,4-propano-9-(6-phenylhexyl)-1,4,9-triazaspiro[5.5]undecane,

(57) 1-(1-benzyl-3-pyrrolidinyl)-2,5-dioxo-3,4-propano-9-(6-phenylhexyl)-1,4,9-triazaspiro[5.5]undecane,

(58) 1-(2-furanylmethyl)-2,5-dioxo-3,4-propano-9-methyl-1,4,9-triazaspiro[5.5]undecane,

(59) 1-(2-tetrahydrofuranylmethyl)-2,5-dioxo-3,4-propano-9-methyl-1,4,9-triazaspiro[5.5]undecane,

(60) 1-(2-(3-indole)ethyl)-2,5-dioxo-3,4-propano-9-methyl-1,4,9-triazaspiro[5.5]undecane,

(61) 1-benzyl-2,5-dioxo-3,4-propano-9-methyl-1,4,9-triazaspiro[5.5]undecane,

(62) 1-(2,2-diphenylethyl)-2,5-dioxo-3,4-propano-9-methyl-1,4,9-triazaspiro[5.5]undecane,

(63) 1-(2-phenylethyl)-2,5-dioxo-3,4-propano-9-methyl-1,4,9-triazaspiro[5.5]undecane,

(64) 1-propyl-2,5-dioxo-3,4-propano-9-methyl-1,4,9-triazaspiro[5.5]undecane,

(65) 1-(1-benzyl-3-pyrrolidinyl)-2,5-dioxo-3,4-propano-9-methyl-1,4,9-triazaspiro[5.5]undecane,

(66) (3S)-1-propyl-2,5-dioxo-3,4-((2R)-2-benzyloxy-1,3-propano)-9-(6-phenylhexyl)-1,4,9-triazaspiro[5.5]undecane,

(67) (3R)-1-propyl-2,5-dioxo-3,4-(2-thiapropano)-9-(6-phenylhexyl)-1,4,9-triazaspiro[5.5]undecane,

(68) 1-butyl-2,5-dioxo-3,3-butano-9-benzyl-1,4,9-triazaspiro[5.5]undecane,

(69) 1-butyl-2,5-dioxo-3,3-butano-1,4,9-triazaspiro[5.5]undecane, or

(70) 1-butyl-2,5-dioxo-3,3-butano-9-[4-(4-methylcarbamoylphenoxy)benzyl]-1,4,9-triazaspiro[5.5]undecane,
a quaternary ammonium salt thereof, an N-oxide thereof or a non-toxic salt thereof.

3. A pharmaceutical composition comprising the triazaspiro[5.5]undecane derivative of the formula (I) according to claim 1, a quaternary ammonium salt thereof, an N-oxide thereof or a non-toxic salt thereof, as an active ingredient.

4. A chemokine/chemokine regulator comprising the triazaspiro[5.5]undecane derivative of the formula (I) according to claim 1, a quaternary ammonium salt thereof, an N-oxide thereof or a non-toxic salt thereof, as an active ingredient.

5. A prevention and/or treatment agent for asthma, atopic dermatitis, urticaria, allergic bronchopulmonary aspergillosis, allergic eosinophilic gastroenteritis, nephritis, nephropathy, hepatitis, arthritis, rheumatoid arthritis, psoriasis, rhinitis, conjunctivitis, ischemic reperfusion disorder, multiple sclerosis, ulcerative colitis, adult respiratory distress syndrome, cytotoxic shock, diabetes, autoimmune disease, multiple organ failure, immunosuppression, cancer metastasis and acquired immune deficiency syndrome, comprising the triazaspiro[5.5]undecane derivative of the formula (I) according to claim 1, a quaternary ammonium salt thereof, an N-oxide thereof or a non-toxic salt thereof, as an active ingredient.